

It is claimed:

1. A multi-mode mobile communication device for use in a plurality of wireless access networks, the multi-mode mobile communication device being operable to establish a communication link with a core network over a first wireless access network and transfer the communication link from the first wireless access network to a second wireless access network, comprising:

a first access module operable to communicate over the first wireless access network;

a second access module operable to communicate over the second wireless access network;

a non-access stratum (NAS) module operable to communicate using a protocol compatible with the core network;

an access stratum manager (ASM) module that interfaces the NAS module with the first and second access modules;

the ASM module being operable to establish the communication link between the NAS module and the core network using the first access module; and

the ASM module being further operable to maintain the communication link between the NAS module and the core network while transferring the communication link from the first access module to the second access module;

wherein the multi-mode mobile communication device measures the respective signal strengths of the first wireless access network and the second wireless access network, and the ASM module initiates the transfer of the communication link from the first access module to the second access module in response to a handover control signal generated by first access module in response to the measured signal strengths.

2. The multi-mode mobile communication device of claim 1, wherein the ASM module sends a handover notification signal to the NAS module that indicates that the communication link is being transferred from the first wireless access network to the second wireless access network.
3. The multi-mode mobile communication device of claim 2, wherein in response to receiving the handover notification signal, the NAS generates a location updating request signal that causes the second access stratum to initiate a location updating procedure.
4. The multi-mode mobile communication device of claim 1, wherein one of the first wireless access network or the second wireless access network is a Universal Mobile Telecommunications System (UMTS).
5. The multi-mode mobile communication device of claim 1, wherein one of the first wireless access network or the second wireless access network is a Global System for Mobile Communications (GSM) network.
6. The multi-mode mobile communication device of claim 1, wherein the NAS module interfaces a device application with the core network.
7. The multi-mode mobile communication device of claim 6, wherein the device application is an internet protocol (IP) application.

8. The multi-mode mobile communication device of claim 7, wherein the IP application is an electronic mail application.
9. The multi-mode mobile communication device of claim 7, wherein the IP application is a web browser application.
10. The multi-mode mobile communication device of claim 6, wherein the device application is a telephony application.
11. The multi-mode mobile communication device of claim 1, wherein the first access module initiates the signal strength measurements of both the first wireless access network and the second wireless access network.
12. The multi-mode mobile communication device of claim 11, wherein the second access module remains in an inactive state while multi-mode mobile communication device measures the signal strengths of the first and second wireless access networks.
13. In a multi-mode mobile communication device including a processing device, a memory sub-system, a communication sub-system operable to communicate with a plurality of wireless access networks, and a protocol stack stored in the memory sub-system and executed by the processing device, the protocol stack comprising:
 - a first access stratum for communicating with a first wireless access network via the communication sub-system;

a second access stratum for communicating with a second wireless access network via the communication sub-system;

a non-access stratum (NAS) for communicating with a core network;

an access stratum manager for interfacing the NAS with the first and second access strata;

the access stratum manager being operable to activate the first access stratum to establish a communication link with the core network over the first wireless access network; and

the access stratum manager being further operable to maintain the communication link between the NAS and the core network while transferring the communication link from the first access stratum to the second access stratum;

wherein the multi-mode mobile communication device measures the respective signal strengths of the first wireless access network and the second wireless access network, and the access stratum manager initiates the transfer of the communication link from the first access stratum to the second access stratum in response to a handover control signal generated by the first access stratum in response to the measured signal strengths.

14. The protocol stack of claim 13, wherein the multi-mode mobile communication device further includes a software application stored in the memory sub-system and executable by the processing device, the software application when executed by the processing device being operable use the non-access stratum to communicate with the core network.

15. The protocol stack of claim 13, wherein the access stratum manager sends a handover notification signal to the NAS that indicates that the communication link is being transferred from the first wireless access network to the second wireless access network.

16. The protocol stack of claim 13, wherein the first wireless access network or the second wireless access network is a Universal Mobile Telecommunications System (UMTS) network.

17. The protocol stack of claim 13, wherein the first wireless access network or the second wireless access network is a Global System for Mobile Communications (GSM) network.

18. The protocol stack of claim 13, wherein the first access stratum includes a measurement control sub-program that communicates with a physical layer to request the signal strength measurements for the first wireless access network and the second wireless access network.

19. The protocol stack of claim 18, wherein the first access stratum further includes a cell reselection sub-program that receives the signal strength measurements from the measurement control sub-program and compares the signal strength measurements, wherein the handover control signal is generated based on the comparison of the signal strength measurements.

20. The protocol stack of claim 19, wherein the first access stratum further includes a handover control sub-program that receives a handover request signal from the cell reselection sub-program based on the comparison of the signal strength measurements and, in response to the handover request signal, generates the handover control signal instructing the access stratum manager to initiate the transfer of the communication link from the first access stratum to the second access stratum.

21. The protocol stack of claim 13, wherein the multi-mode mobile communication device may also initiate the transfer of the communication link from the first access stratum to the second access stratum in response to a handover request signal received from the first wireless access network.
22. The protocol stack of claim 21, wherein the first wireless access network receives the signal strength measurements of the first wireless access network and the second wireless access network from the multi-mode mobile communication device and generates the handover request signal based on the received signal strength measurements.
23. The protocol stack of claim 13, wherein in response to the access stratum manager initiating the transfer of the communication link from the first access stratum to the second access stratum, the first access stratum enters a partially active state until the communication link is successfully established with the second access stratum.
24. The protocol stack of claim 23, wherein if the communication link is successfully established with the second access stratum, then the first access stratum enters an inactive state.
25. The protocol stack of claim 23, wherein if the communication link is not successfully established with the second access stratum, then the first access stratum returns to an active state and the second access stratum enters an inactive state.